

## REMARKS

In view of the amendments and discussions to follow, Applicants submit that Claims 16, 18-28, which are in the application are patentably distinct. Claims 14, 15 and 17 have been canceled. Claim 23 has been amended to recite the term "the softener" which has an antecedent basis in newly added independent Claim 28, which replaces the canceled independent Claim 14. Basis for the newly added Claim 28 is found essentially in original Claims 15 and 17.

Claims 14-23 and 25-27 are rejected under 35 U.S.C. 103(a) as being unpatentable over Dybdal et al., WO 96/19611 and Carroll, US 3,847,543 and further in view of Laas et al., US 5,731,396. Claim 24 is rejected under 35 U.S.C. 103(a) as being unpatentable over Dybdal et al., WO 96/19611 in view of Laas et al., US 5,731,396 as applied to Claim 17, and further in view of Vogel et al., US 5,047,065.

Claim 17 and 23 stand rejected under 35 U.S.C. 112, second paragraph as being indefinite. Claims 18-24 are similarly rejected for their dependency on Claim 17. By the above amendments, Applicants have overcome the 35 U.S.C. 112, second paragraph, rejection of the claims as being indefinite.

As to the 35 U.S.C. 103 rejections, while the above amendments avoid the rejections, it bears noting for the record that the cited references fail to provide sufficient evidence supporting a prima facie case of obviousness. More specifically, the secondary references lack a basis for substituting for an essential element of the primary reference - proteolytic enzymes. Illustratively, the Examiner correctly noted, the secondary reference Carroll is deficient in failing to cure the deficiency of the primary reference in failing to explicitly teach the claim recited self-dispersible isocyanates. Applicants hasten to note that Carroll, and for that matter the other secondary references, fail to explicitly or implicitly teach modification of the primary reference with the claim-specified self-dispersing isocyanates. Laas, cited to cure the deficiency of Carroll, is in itself admittedly deficient in teaching a dispersion of two components as starting materials for polyisocyanates, instead of the self-dispersible isocyanates and in a completely different field of coating compositions.

The 35 U.S.C. 103(a) rejection is argued more fully hereunder. The rejection of Claims 14-23 and 25-27 is based on the grounds that:

"...Dybdal et al., discloses method of producing wool having improved shrink resistance, anti-felting, whiteness, dyeability, and softness properties (Abstract). The method comprises exposing the wool fibers to plasma treatment and a proteolytic enzyme (Abstract). The wool fibers may include wool from sheep, camel, rabbit, goat and lama, (i.e., merino or shetland wool) (Page 9, 34-37). Dybdal et al., further teaches adding softeners either simultaneous with the enzyme treatment or after the plasma treatment. Suitable softeners include organic cationic or silicone based products (Page 16, 20-37)."

In an attempt to overcome the shortcoming of Dybdal et al., the Examiner cites the secondary reference Carroll as curing the deficiency of Dybdal et al., but at once and correctly notes Carroll's insufficiency, as delineated below. Specifically, the Examiner contends that:

"Dybdal et al., fails to teach adding an aqueous dispersion of isocyanates, however, the patent issued to Carroll discloses treating wool substrates with polyisocyanate solutions to impart reduce shrinkage (Abstract and Column 1, 24-30).

Carroll does not explicitly teach the claimed polyisocyanate composition, however, the patent issued to Laas et al., discloses a water dispersible polyisocyanate mixture suitable for use as textile coatings (Column 8, 9-13). The isocyanate mixture comprises an isocyanate group content (calculated as NCO molecular weight 42) of 7.0 to 21.5 weight percent, an ethylene oxide content (calculated as molecular weight 44) of 5 to 25 weight percent and an average NCO functionality of 1.8 to 4.6 (Column 3, 34- Column 4, 17). The polyisocyanates are selected from the group consisting of aliphatically or cycloaliphatically having NCO functionality from 2.1 to 5.0 (Column 4, 27-34). The number of ethylene oxide units is more than 10 (Column 6, 49-50). The amount of ethylene radicals, based on the total quantity of alkylene radicals is at least 80 mole percent (Column 5, 15-17). With regard to claim 26, since the solutions of Laas are aqueous it is reasonable to presume that the solution would be applied to wool by any known method in the art such as dipping, spraying, rolling or padding.

Therefore, motivated to increase the shrink resistance of wool textiles it would have been obvious to one having ordinary skill in the art to coat the wool substrate of Dybdal et al., with the polyisocyanate binder mixture of Laas et al. Motivation to specifically treat wool substrates with isocyanate is found in the explicit teachings of Carroll."

Finally, the Examiner combined yet another reference, Vogel et al. in an attempt to cure the deficiency of Dybdal et al. in view of Laas et al. in further rejecting Claim 24, as follows.

“Claim 24 is rejected under 35 U.S.C. 103(a) as being unpatentable over Dybdal et al., WO 96/19611 in view of Laas et al., US 5,731,396 as applied to claim 17, and further in view of Vogel et al., US 5,047,065.

Dybdal and Laas et al., fail to teach adding a slip agent but the patent issued to Vogel et al., discloses an aqueous finishing agent for textiles which may further comprise auxiliary anti-slip agents (Abstract and Column 4, 25). Vogel et al., fails to teach a specific anti-slip agent however, it would have been obvious to one having ordinary skill in the art at the time the invention was made to select a known anti-slip agent since it has been held to be within the general skill of a worker in the art to select a known material on the basis of its suitability for the intended use. *In re Leshin*, 125 USPQ 416”

Statement of How the Claims Avoid or Overcome the Rejection under § 103(a)  
Claim

The issues presented here are whether there is any motivation in the cited references for combining them with a reasonable expectation of success in providing the claimed invention. It is well established that in the determination obviousness, it is necessary to ascertain in the first place whether the reference teachings explicitly or implicitly would appear to be sufficient to the skilled artisan to make the proposed substitution, combination or other modifications, *In re Linter* 173 USPQ 560 (CCPA 1972). “The test for an implicit showing is what the teachings, knowledge of the skilled artisan, and the nature of the problem to be solved as a whole would have suggested to those of ordinary skill in the art, *In re Kotzab* 55 USPQ 2d 1313 (Fed. Cir. 2000).

In this case, the record is devoid of any showing in the secondary references supporting an explicit or implicit showing which would have led the skilled artisan to substitute proteolytic enzyme treatment of substrates as disclosed in the primary

reference for treatment with self-dispersible isocyanates as recited by the claims. The references are discussed and distinguished hereunder

Dybdal et al. discloses a process for preparing wool with improved properties by

- (1) treating the wool with a plasma and
- (2) subjecting the wool to a treatment with a proteolytic enzyme.

To be sure, the treatment of wool with plasma to reduce the felting tendency is generally known from prior art. As such, read for what it stands, Dybdal et al.'s contribution lies in its process step (2) comprising contacting wool with the proteolytic enzyme to impart certain improved properties of the wool. These improved properties are listed on page 3, lines 22 - 27 and include a further reduction of the felting tendency (additional to the reduction obtainable by the plasma treatment) and also an improvement of softness. Additional softening is obtained by a further step comprising contacting the wool with a softener.

This process differs from the process of the present invention with particular reference to step (2). While Dybdal et al. mandatorily contacts the wool with the proteolytic enzyme, the present invention mandatorily comprises the treatment of the wool with the self-dispersing isocyanates.

Lacking from Dybdal et al. is any basis for substituting treatment of the wool with proteolytic enzyme with treatment with self-dispersing isocyanates.

### **Carroll**

Carroll discloses impregnating a textile material in order to render the textile less susceptible to relaxation and felting shrinkage, using an aqueous dispersion of two components, i.e., an aliphatic polyisocyanate and a polyglycol having 2-4 hydroxyl groups per molecule.

Quite distinctly, Carroll differs from the present invention in various regards: The dispersion used in Carroll comprises two components, which have not yet

reacted with each other. Once applied to the fiber, the polyisocyanates react with the polyol with a formation of a polymeric network on the fiber surface, to produce urethane bridging groups between monomeric repeating units. Carroll's dispersion fiber has the disadvantage that the two components are not very soluble/dispersible in water, which fact requires the additional presence of an emulsifying agent and an organic solvent as well (see Carroll, column 2, lines 43-60).

In contrast, in the present invention, the wool is contacted with a dispersion of isocyanates, which have already been prepared by reacting a polyisocyanates (I) with a monofunctional hydroxy-component (II). Due to such mono-functionality, the resulting isocyanates do not form high molecular weight polymers and, therefore, possess the advantage of being self-dispersing without any addition of emulsifying agent or organic solvent. They can be readily handled and are stable for many months in storage. Once applied to the fiber surface, the isocyanate end groups react with water with the formation of urea-bridging groups.

From the foregoing, it is quite clear that Carroll's mixtures of polyisocyanates and polyols are different from and do not suggest the specified self-dispersing isocyanates of the present invention. Nothing herein supports the assertion that Carroll explicitly or implicitly suggests the substitution of its two-component dispersions for Dybdal et al.'s proteolytic enzymes. Assuming arguendo that such a combination could be made, the resulting product would be different and would not suggest the claims, since Carroll's dispersions are different and lack a basis for modification to the claims. Hence, the present invention is not rendered obvious by the combination of Dybdal et al. and Carroll.

#### **Laas et al.**

With the intention of closing the still existing gap between the present invention and the combination of Dybdal et al. and Carroll, the Examiner further cited Laas et al. Laas et al. discloses self-dispersing but structurally different isocyanates for use in coating composition. As shown in Laas et al., column 3, lines 35-64, these polyisocyanates mandatorily comprise opened  $\epsilon$ -caprolactone repeating units (CO-

(CH<sub>2</sub>)<sub>5</sub>-C-O-) in polyester chains. The presence of such ε-caprolactone repeating units obviously allows the use of a lower number of polyethyleneoxide repeating units in the polyisocyanates without decreasing the stability to sedimentation.

It is open to question as to whether Laas et al. is combinable with Dybdal et al., in view of Carroll, given that the Laas et al. disclosure is in a completely different field of application. Namely, Laas et al.'s self-dispersing isocyanates are intended to serve as starting molecules in the preparation of polyurethanes which are used particularly in 2K-PUR coating compositions (see column 1, lines 6-26, column 2, lines 56-65). Laas et al. does not refer at all to the treatment of wool and the object underlying the present invention, which is providing wool having an improved antifelt finish.

Assuming arguendo that Laas et al. is combinable, such a combination would not have led to present invention with a reasonable expectation of success. For, Laas et al. does not give any hint or suggestion that its very specific self-dispersing isocyanates (differing from the ones of the present invention) might have the property of providing wool with an antifelt finish.

Summing up, it is open to question whether an artisan would have been motivated to consider Laas et al. with the intention to modify/improve the process of Dybdal et al. Therefore, this citation of Laas et al. does not add anything of relevance to the disclosure of Dybdal et al. or Carroll.

### **Vogel**

Claim 24 is further rejected over Dybdal et al., in view of Laas et al., and in view of Vogel. Similarly to Laas et al., the disclosure of Vogel has nothing to do with treating wool in order to accomplish an antifelt finishing of such wool. The aqueous finishing agent used in Vogel to provide a softening effect to fibrous materials comprises various very specific components (see Claim 1). The only thing in common with the present invention resides in the fact that such finishing agent serves as a softening agent. Nonetheless, there was no motivation for any artisan to even consider Vogel

as being combinable with Dybdal et al. Assuming arguendo that the skilled artisan would have considered Vogel combinable, such combination would not have cured the various deficiencies of Dybdal et al. or the secondary references, Carroll, or Laas et al.

Net: The deficiency of the primary reference, Dybdal et al., in failing to employ the claim specified self-dispersing isocyanates is not cured by Carroll, since there is no basis in either reference for substituting for Dybdal et al.'s proteolytic enzymes. The lack of basis is not cured by Laas et al. which relates to the use of different isocyanates in a different field of invention. Similarly, the lack of basis is not cured by Vogel relating to softening of substrates as opposed the antifelt treatment.

In view of the foregoing, Applicants submit that the cited references do provide sufficient evidence supporting a prima facie case of obviousness.

At any rate, by the above amendments, Applicants have overcome the 35 USC 103(a) rejection in that the claims recite the invention more distinctly by specifying the self-dispersing isocyanate. The Examiner is therefore justified in allowing the amended claims.

Respectfully submitted,

By 

Godfried R. Akorli  
Attorney for Applicants  
Reg. No. 28,779

Bayer Chemicals Corporation  
100 Bayer Road  
Pittsburgh, Pennsylvania 15205-9741  
(412) 777-3061  
FACSIMILE PHONE NUMBER:  
(412) 777-2612

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